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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/462,345	01/07/2000	TAKAYUKI YOSHIGAHARA	KOIK-P9492	4972
29175	7590	04/07/2005	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			JERABEK, KELLY L	
			ART UNIT	PAPER NUMBER
			2612	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/462,345

Applicant(s)

YOSHIGAHARA ET AL.

Examiner

Kelly L. Jerabek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7, 9, 11-12, 14-15, and 17 rejected under 35 U.S.C. 102(b) as being anticipated by Cox US 5,383,013.

Re claim 1, Cox discloses in figures 1 and 2 a computer vision system for measuring distance to an object. The system includes a pair of cameras (21,22) disposed at different positions. The cameras form images of objects whose distances to the cameras are determined by the system (col. 3, line 65 – col. 4, line 4). The

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signals generated by the cameras are supplied to a correlation detecting means (CPU (23)). The correlation detecting means (CPU (23)) compares picture data generated by the cameras to detect correlation between the data using a set of measurements obtained by each camera along corresponding epipolar lines (col. 3, line 65 – col. 4, line 45). The CPU (23) also serves as a distance picture generating means because it determines a set of correspondences regarding the cameras according to a minimum cost algorithm in order to set a distance between the cameras or their midpoints (virtual position) and the object to be imaged (col. 4, line 10 - col. 6, line 13).

Re claim 2, Cox states that conventional correlation based techniques examine the correlation between the intensities of image signals (pixel data) within regions or windows of varying sizes (col. 2, lines 19-35).

Re claim 7, the correlation detecting means (CPU (23)) disclosed by Cox compares picture data on epipolar lines to detect correlations to respective pixel blocks constituting a distance picture (col. 4, lines 1-45). Cox also discloses using a minimum cost algorithm to set a distance between the cameras or their midpoints (virtual position) and the object to be imaged (col. 4, line 10 - col. 6, line 13). The Examiner is reading the cost algorithm disclosed by Cox as a means of determining the highest correlation to select the distance.

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Re claim 9, The correlation detecting means (CPU (23)) compares picture data generated by the cameras to detect correlation between the data using a set of measurements obtained by each camera along corresponding epipolar lines (col. 3, line 65 – col. 4, line 45). The CPU (23) also serves as a distance picture generating means because it determines a set of correspondences for the entire image regarding the cameras according to a minimum cost algorithm in order to set a distance between the cameras or their midpoints (virtual position) and the object to be imaged (col. 4, line 10 - col. 6, line 13). The Examiner is reading the cost algorithm disclosed by Cox as a means of determining the highest correlation to select the distance.

Re claim 11, see claim 1.

Re claim 12, see claim 2.

Re claims 14 - 15, see claim 7.

Re Claim 17, see claim 9.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 6, 8, 10, 13, 16, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of Applicant's Admitted Prior Art.

Re claim 3, Cox discloses all of the limitations of claim 1 above. However, Cox fails to state that a variable density picture is generated using luminance information when the object to be imaged is imaged from a virtual position on the basis of the picture data generated by image pick-up means.

The Applicant states that it is well known in the prior art to virtually dispose a camera unit using spatial coordinates of an object to be images to generate a distance picture to be observed by a camera unit virtually disposed and to generate a variable density picture (Specification: page 2, lines 3-8). The Admitted Prior Art also states that a variable density picture is generated using luminance information (Specification: page 4). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the concept of virtually disposing a camera at a calculated virtual point on an epipolar line as disclosed by the Applicant's Admitted Prior Art in the computer vision system for generating distance information for two image pick-up cameras disclosed by Cox. Doing so would provide a means for generating a distance picture and a variable density picture (Specification: page 2).

Re claim 4, see claim 3. The Examiner is reading the camera unit virtually disposed as disclosed in the Applicant's admitted prior art as a reference camera.

Re claim 6, the Applicant's Admitted Prior Art states that it is well known in the prior art to virtually dispose a camera unit using spatial coordinates of an object to be images to generate a distance picture to be observed by a camera unit virtually disposed and to generate a variable density picture (Specification: page 2, lines 3-8). The Examiner is reading the camera unit virtually disposed as disclosed in the Applicant's admitted prior art as a reference camera.

Re claim 8, Cox discloses all of the limitations of claim 7 above. However, Cox fails to state that a variable density picture is generated using luminance information when the object to be imaged is imaged from a virtual position on the basis of the picture data generated by image pick-up means.

The Applicant states that it is well known in the prior art to virtually dispose a camera unit using spatial coordinates of an object to be images to generate a distance picture to be observed by a camera unit virtually disposed at a location having highest correlation and to generate a variable density picture (Specification: page 2, lines 3-8). The Admitted Prior Art also states that a variable density picture is generated using luminance information (Specification: page 4). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the concept of virtually disposing a camera at a calculated virtual point on an epipolar line as disclosed by the

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Applicant's Admitted Prior Art in the computer vision system for generating distance information for two image pick-up cameras disclosed by Cox. Doing so would provide a means for generating a distance picture and a variable density picture (Specification: page 2).

Re claim 10, Cox discloses all of the limitations of claim 9 above. However, Cox fails to state that a variable density picture is generated using luminance information when the object to be imaged is imaged from a virtual position on the basis of the picture data generated by image pick-up means.

The Applicant states that it is well known in the prior art to virtually dispose a camera unit using spatial coordinates of an object to be images to generate a distance picture to be observed by a camera unit virtually disposed and to generate a variable density picture (Specification: page 2, lines 3-8). The Admitted Prior Art also states that a variable density picture is generated using luminance information (Specification: page 4). Therefore, it would have been obvious for one skilled in the art to have been motivated to include the concept of virtually disposing a camera at a calculated virtual point on an epipolar line as disclosed by the Applicant's Admitted Prior Art in the computer vision system for generating distance information for two image pick-up cameras disclosed by Cox. Doing so would provide a means for generating a distance picture and a variable density picture (Specification: page 2).

Re claim 13, see claim 3.

Re claim 16, see claim 8.

Re claim 18, see claim 10.

Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of Applicant's Admitted Prior Art and further in view of Nishimura 5,667,474.

Re claim 5, the combination of the Cox reference and the Applicant's Admitted Prior Art discloses all of the limitations of claim 4 above. However, the combination fails to disclose a light emitting means for irradiating pattern light of a predetermined area on the object to be imaged and a filter for shielding pattern light of the area incident to the reference camera.

Nishimura discloses in figure 1 a field sequential image pickup apparatus. The apparatus includes a light source (100) including a color disk (12) that includes an IR filter (16IR). The color disk (12) filters light that is incident on a CCD (21) of an endoscope (200) (col. 3, lines 20-45). The filtered infrared light is used to detect movement in an image of observation (col. 3, line 20 – col. 4, line 8). Therefore, it would have been obvious for one skilled in the art to have been motivated to include a light source and a filter for irradiating filtered light onto a subject to be imaged as disclosed by Nishimura in the system for generating distance information for two image pick-up cameras disclosed by Cox in view of the Applicant's Admitted Prior Art. Doing

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so would provide a means for displaying an infrared imaged of an object irrespective of movement of the object (Nishimura: col. 2, lines 1-5).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Iijima et al. (US 6,839,081) discloses a virtual image sensing and generating method. The information regarding using an epipolar line to detect a state of movement of an image input unit is relevant material.

Yoshigahara et al. (US 2002/0085747) discloses an image processing apparatus and method. The information regarding using an epipolar line for image processing is relevant material.

Tanaka et al. (US 6,233,004) discloses an image processing method and apparatus. The information regarding detecting correspondence using an epipolar line is relevant material.

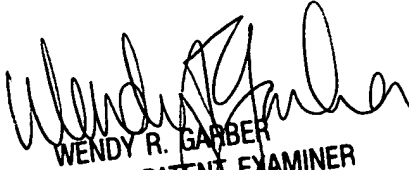
Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly L. Jerabek whose telephone number is **(571) 272-7312**. The examiner can normally be reached on Monday - Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on **(571) 272-7308**. The fax phone number for submitting all Official communications is 703-872-9306. The fax phone number for submitting informal communications such as drafts, proposed amendments, etc., may be faxed directly to the Examiner at **(571) 273-7312**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KLJ


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